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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,466	12/05/2003	Jayaram K. Beladakere	4998P024	9415

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EXAMINER

JUNTIMA, NITTAYA

ART UNIT	PAPER NUMBER
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2616

MAIL DATE	DELIVERY MODE
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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/728,466

Applicant(s)

BELADAKERE ET AL.

Examiner

Nittaya Juntima

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: the signed date for the sixth inventor (Adam A. Weiss) is missing.

Claim Objections

2. Claims 9, 12, 13, 16, and 19 are objected to because of the following informalities:

- in claim 9, line 6, “the” should be removed;

line 7, “it is determined that” should be removed and “as a result of the determination” should be added after “reservations” to make the claim more clear’

- in claims 12 and 13, line 2, “tables” should be changed to “table” as there is only one table cited in independent claim 10;

- in claim 16, line 4, “the” should be removed;

- in claim 19, line 3, “tables” should be changed to “table” as there is only one table cited in independent claim 10.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

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3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 5-8, 10-15, and 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Best (US 7,218,637 B1).

Regarding claim 1, Best teaches a method for operating a switching node (a switching system shown in Fig. 1), comprising:

Maintaining a packet-switched fabric (switching core 11, Fig. 1 contains switch fabric is maintained in a switching system, col. 5, lines 34-35 and col. 7, lines 44-46).

Overlaying the packet-switching of the fabric with a repeating synchronized frame (as shown in Fig. 3, data is transmitted in a time slot of a frame to the switching core 11, Fig. 1, col. 6, lines 8-36, col. 7, lines 44-46, and col. 8, lines 23-27).

Regarding claim 2, Best teaches maintaining a table having a row of entries (a schedule as shown in Fig. 3 is provided), each entry corresponding to a timeslot of the frame (a block indicating the destination egress edge representing a slot of a frame); populating the entries in the table according to a contention-free allocation (non-blocking); and transmitting a cell on a timeslot in accordance with the populated table (a packet is transmitted in an assigned time slot as scheduled). See col. 6, lines 5-36, 57-62, and col. 8, lines 23-27.

Regarding claim 5, Best teaches maintaining the table (schedule, Fig. 3) with a central management (a core scheduler 13, Fig. 1) that manages tables (schedules at edge units 12) of multiple switch interface devices (edge units 12, Fig. 1) in a system (Fig. 1). See col. 5, lines 28-48 and col. 8, lines 15-27.

Regarding claim 6, Best further teaches transmitting cells of TDM traffic (TDM packets) from multiple discrete switch interface devices (edge units 12, Fig. 1 with TDM cards), each according to a populated table (schedule, Fig. 3), to avoid arbitration of the TDM traffic via a central scheduler (core scheduler 13, Fig. 1) at a core of the switch fabric (switching core 11, Fig. 1). See col. 5, lines 28-48, col. 6, lines 11-36, col. 7, lines 22-35, 41-50.

Regarding claim 7, Best also teaches providing a synchronization signal to demark the frame (since a global timing mechanism is used to synchronize the entire system, col. 5, lines 32-34, a special synchronization hardware synchronizes packet transfers through the core optical matrix, col. 9, lines 26-28, and a frame is used for packet transfers, col. 8, lines 23-26, a synchronization signal to demark the frame must be provided).

Regarding claim 8, Best also teaches providing distributed switching of TDM traffic from multiple sources of TDM traffic over the fabric (edge devices 12, Fig. 1 and schedule receive and support multiple TDM traffic streams which must be transmitted from multiple sources, col. 7, lines 29-35, 44-46, and 65-67, and col. 8, lines 38-40).

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Regarding claim 10, as shown in Fig. 1, Best teaches a switching system comprising:

A packet-switched switching fabric (switch fabric in the core, col. 5, lines 34-35 and col. 7, lines 44-46).

Multiple switch interfaces (edge units 12) having a table of entries (schedule, Fig. 3), each entry corresponding with a timeslot on a frame, the multiple switch interfaces to transmit cells of traffic in accordance with the entries in the table (col. 5, lines 36-48, col. 6, lines 11-36, col. 7, lines 41-51, and col. 8, lines 15-27).

A switching management circuit (switching core 11 containing core scheduler 13 and a special synchronization hardware, collectively) to define the frame and synchronize switching of traffic over the fabric (col. 5, lines 32-38 and col. 9, lines 26-28).

Regarding claim 11, Best teaches that the switching management circuit (core scheduler 13, Fig. 1) populates the entries in the table (schedule in Fig. 3) to a contention-free allocation (non-blocking). See col. 6, lines 5-36

Regarding claim 12, Best teaches that the switching management circuit (core scheduler 13, Fig. 1) to manage the table (schedule in Fig. 3) to provide timeslot-reservation table for TDM traffic (time slots in a schedule shown in Fig. 3 are used to transmit TDM packets). See col. 6, lines 11-36 and col. 7, lines 22-35, and col. 8, lines 15-27 and 34-40.

Regarding claim 13, Best teaches that the switch management circuit provides modifications of the tables to the multiple switch interfaces (col. 4, lines 22-41 and col. 9, lines 25-39).

Regarding claim 14, Best teaches that the switch management circuit (global timing mechanism) to provide a synchronization signal to the switch fabric and the multiple switch interfaces to demark the frame (since a global timing mechanism is used to synchronized the entire system, col. 5, lines 32-34, a special synchronization hardware synchronizes packet transfers through the core optical matrix, col. 9, lines 26-28, and a frame is used for packet transfers, col. 8, lines 23-26, a synchronization signal to demark the frame must be provided).

Regarding claim 15, Best teaches that the multiple switch interfaces are directly interconnectable for system input to system output via the timeslots on the frame synchronized by the switch management circuit (Fig. 1 and col. 5, lines 28-48 and col. 7, lines 44-46).

Regarding claim 17, Best also teaches that the switch fabric comprises multiple discrete switching circuits (the space switch fabric in the core must comprise multiple discrete switching circuits in order to switch packets from a plurality of ingress ports to a plurality of egress ports, col. 7, lines 44-50).

Regarding claim 18, Best teaches that the multiple switch interfaces (edge units 12, Fig. 1) comprise multiple ingress/egress linecards (TDM cards/POS cards, col. 5, lines 30-35, col. 7, lines 1-32, and Fig. 4).

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Regarding claim 19, Best further teaches the switch management circuit (switching core 11 containing core scheduler 13 and a special synchronization hardware, collectively) comprises a switch management linecard (means that contains a special synchronization hardware and scheduler, collectively) having a circuit to generate a synchronization signal (a special synchronization hardware, col. 9, lines 26-28 and col. 10, lines 57-59) and a circuit (scheduler 13, Fig. 1, col. 5, lines 36-38 and col. 10, lines 46-48) to provide management of the table.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Best (US 7,218,637 B1).

Regarding claim 3, Best does not explicitly teach maintaining a timeslot-reservation table for TDM traffic and populating the entries in the table with a contention-free algorithm to provide exclusive reservation of timeslots in the frame for cells of TDM traffic.

However, Best also teaches maintaining a timeslot-reservation table (a schedule in Fig. 3 is used for TDM traffic and packet traffic, col. 6, lines 11-36 and col. 7, lines 12-14 and 41-48) and populating the entries in the schedule using a non-blocking scheduling algorithm (col. 6, lines 5-10 and col. 7, lines 29-35, and col. 8, lines 20-27 and 34-40). Therefore, it would have

been obvious to one skilled in the art at the time the invention was made to modify the teaching of Best to include maintaining a timeslot-reservation table for TDM traffic and populating the entries in the table with a contention-free algorithm to provide exclusive reservation of timeslots in the frame for cells of TDM traffic as claimed. The suggestion/motivation to do so would have been to modify the schedule/table to serve the system when only TDM traffic is received over a certain period of time, for example, a number of consecutive frames, and such modification involves only routine skills in the art.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Best (US 7,218,637 B1) in view of McCrosky (US 6,876,650 B2).

Regarding claim 4, Best teaches providing a contention-free allocation in time and space of TDM traffic using a heuristic scheduling algorithm (col. 7, lines 41-46 and col. 8, lines 34-41), not a Slepian-Duguid-based algorithm as claimed.

However, McCrosky teaches using a Slepian-Duguid-based algorithm in time and space switching fabric for TDM switching of signals (col. 1, lines 11-40).

Given the teaching of McCrosky, it would have been obvious to one skilled in the art at the time the invention was made to further modify the teaching of Best such that a contention-free allocation in time and space of TDM traffic using a heuristic scheduling algorithm would be provided. The suggestion/motivation to do so would have been to schedule connections in rearrangeably non-blocking switches that always succeeds on loads of up to 100% capacity as suggested by McCrosky (col. 1, lines 26-28 and 39-40).

8. Claim 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Best

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(US 7,218,637 B1) in view of Personick (US 2002/0191588 A1).

Regarding claims 9 and 16, although Best teaches the switch management circuit (switching core 11 containing core scheduler 13 and a special synchronization hardware, collectively, col. 5, lines 32-38 and col. 9, lines 26-28) populates a TDM timeslot reservation table (schedule contains TDM timeslots of a frame, col. 6, lines 11-36 and col. 8, lines 20-27), Best does not teach that the switch management circuit prevents PDU traffic from being transmitted on a timeslot that is reserved for TDM traffic, determines whether an egress device has bandwidth that is not reserved for TDM traffic by TDM timeslot reservations, and transmits PDU traffic to the egress device if it is determined that the egress device has available bandwidth that does not contend with the TDM traffic reservations.

However, as shown in Fig. 5, Personick teaches the core switch that prevents PDU traffic from being transmitted on a timeslot that is reserved for TDM traffic (steps 122, packet switched packets cannot be transmitted in timeslots reserved for and contain circuit switched packets, paragraph 51 and claim 6), determines whether an egress device has bandwidth that is not reserved for TDM traffic by TDM timeslot reservations (step 122, packet switched packet(s) is transmitted in a time slot(s) which has not been reserved for circuit switched data on the selected outgoing link 24 which is connected to an output switch 26b, paragraph 51 and claim 6), and transmitting PDU traffic to the egress device if it is determined that the egress device has available bandwidth that does not contend with the TDM traffic reservations (step 124, paragraph 51 and claim 6).

Therefore, it would have been obvious to one skilled in the art at the time the invention

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- US 2003/0026250 A1, disclosing a method and device for synchronous cell transfer and circuit-packet duality switching (Abstract, Figs. 1-4, 7, and paragraphs 10-11, 22-26, 29-30, 33, and 34).

- US 6,956,851 B1, disclosing crossbar subsystem (Abstract, Figs. 1, 2, 3, 5, 6, and col. 3, lines 16-col. 4, lines 6, col. 6, lines 13-55).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Nittaya Juntima
Patent Examiner, AU 2616
June 8, 2007